



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,655	10/20/2003	Jun Koyama	0756-7206	4423

31780 7590 03/29/2007  
ERIC ROBINSON  
PMB 955  
21010 SOUTHBANK ST.  
POTOMAC FALLS, VA 20165

EXAMINER
----------

DHARIA, PRABODH M

ART UNIT	PAPER NUMBER
----------	--------------

2629

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/29/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/687,655	<b>Applicant(s)</b> KOYAMA, JUN	
	<b>Examiner</b> Prabodh M. Dharja	<b>Art Unit</b> 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-6, 10, 11, 14, 15, 18, 19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) 1, 7-9, 12, 13, 16, 17 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-6, 10, 11, 14, 15, 18, 19 and 21-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
2. **Status:** Receipt is acknowledged of papers submitted on 02-12-2007 under amendments, which have been placed of record in the file. Claims 2-6, 10, 11, 14, 15, 18, 19 and 21-25 are pending this action. Claims 1,7-9,12,13,16,17 and 20 are cancelled.

***Response to Amendment***

3. The amendment filed 02-12-2007 does not introduce any new matter into the disclosure. The added material which is supported by the original disclosure.
4. Applicant has amended to alleviate the antecedent basis objection in claim 4 for “frequency varying unit” by amending with “the clock frequency” which has support claim 3; therefore 35 U.S.C. 112 rejection antecedent basis for claim 4 is withdrawn.

***Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 6,11,15 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Koyoma Jun (US 2003/0063077 A1).

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

With respect to Claim 6, Koyoma Jun teaches a pixel portion comprising a plurality of pixels (page 3, paragraph 66) formed over a substrate (page 5, paragraph 110); a variable frequency-dividing circuit comprising a first thin film transistor formed over the substrate (page 13, paragraph 296 display controller circuitry 104 are TFT, page 5, paragraph 110, pixel portion and element 104 are integrated on same substrate, page 6, paragraph 147 display controller 104 include CPU and variable frequency divider); and a CPU comprising a second thin film transistor (page 13 paragraph 296 where display controller and pixel portion TFT)), formed over the substrate (page 13, paragraph 296, display controller uses TFT, page 5, paragraph 110, pixel portion and element 104 are integrated on same substrate, page 6, paragraph 147 display controller 104 include CPU and variable frequency divider), wherein the variable frequency-dividing circuit is controlled by the CPU (page 6, paragraph 147), and wherein a dividing ratio is varied according to a display mode (page 6, paragraph 150 gray scale display mode determines the frequency division).

With respect to Claim 11, Koyoma Jun teaches a display device according to claim 6, Koyoma Jun teaches the display device is a liquid crystal display device (page 14, paragraph 324, pages 10,11, paragraph 244, paragraph 262, EL elements inorganic LC liquid crystal).

With respect to Claim 15, Koyoma Jun teaches the display device is an EL display device (pages 10,11 paragraphs 244,262)

With respect to Claim 19, Koyoma Jun teaches a display device according to claim 6, Yanagi teaches a display device wherein the display device is applied to portable electrical equipment such as a portable phone (page 14, paragraph 324-327).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-5,10,14,18,21,22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagi et al. (Pub. No.: US 2002/0036636 A 1) in view of Nanno et al. (US patent # 6,909,413 B2).

With respect to Claim 2, Yanagi teaches a display device comprising: a substrate ([0088]; glass substrate); a pixel portion comprising a plurality of pixels formed over the substrate (See figure 14; [0088], lines 1-10); a driving circuit which controls the pixel portion (See figure 21;

Art Unit: 2629

elements 5 and 6); a charge pump circuit (See figure 21, elements 22, 23 and 32) which supplies a voltage to the driving circuit ([0012]), the charge pump circuit comprising: a switching element (See figure 12, SW1); a capacitor (See figure 12, C1); and a charge pump control circuit (See figure 21, element 32." operation mode controller is a component of the charge pump control circuit, where element 32 controls the charge pump circuit through the signal CNT," note that the charge pump control circuit comprises the charge pump circuit which controls the charge pump circuit.

However, Yanagi does not mention the driving circuit, a switching element, nor a charge pump control circuit formed over the substrate.

However, Nanno et al. teaches an active matrix liquid crystal display (See figure 2, element 12: active matrix liquid crystal display), a switching element (See figure 2, element 20-23, Col. 7, Lines 11-40), a charge pump circuit (See figure 2. power supply circuit element 24 with charge pump element CP1-3 see figure 4, Col. 8, Lines 48-54, Col. 7, Lines 11-40), and a charge pump control circuit (See figures 2, 4,5,Col. 9, Lines 4-25) formed over a common substrate (Col. 3, Lines 22-39).

Nanno et al. modifies the display device of Yanagi the by forming pixel element, the driving circuit, charge pump circuit, and a charge pump control circuit on a common substrate (see abstract, Col. 3, lines 23-39).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have the driving circuit, the switching elements, charge pump circuit, and the charge pump control circuit formed over a common substrate, as taught by Nanno et al. to the display device of Yanagi so as to enable the charge pump circuit to be formed using the same

Art Unit: 2629

thin-film processing as may be required for other elements of the circuit, and enabling higher voltage TFT circuitry (see abstract, Col. 3, lines 23-39).

With respect to Claim 3, a display device according to claim 2, Yanagi teaches the charge pump control circuit can vary a clock frequency to input to the switching element ([0074], lines 1-8).

With respect to Claim 4, a display device according to claim 2, Yanagi teaches a frequency varying unit is controlled by a CPU (See figure 21, element 32: operation mode controller CPU," See figure 17, element 11a is equivalent to a frequency varying unit; note that the control signal CNT inputted to the charge-pump power supply (shown in figure 12) through the element 11).

With respect to Claim 5, a display device according to claim 4, Yanagi teaches the CPU is comprised of a thin film transistor (See figure 6 and 14, 2: TFT panel). Note that a CPU is a semiconductor as are thin film transistors, therefore it would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a CPU comprised of thin film transistors in the display device of Yanagi so as to have a faster response time and higher reliability, characteristic of a thin film transistor.

With respect to Claim 10, a display device according to claim 2, Yanagi teaches the display device is a liquid crystal display device ([0043], lines 1-3).

With respect to Claim 14, Yanagi does not teach the display device is an EL display device Nakajima teaches the display device an EL display Col. 3, Lines 45-60, the charge pump circuit is applicable to both an LCD and EL display).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to teach the display device as an EL display device, as taught by Nanno et al. to the display of Yanagi, so as to have greater versatility in implementing such a device.

With respect to Claim 18, a display device according to, Yanagi teaches a display device wherein the display device is applied to portable electrical equipment such as a portable phone ([0172]).

With respect to Claim 21, a display device according to claim 2, Yanagi teaches the switching element is a transistor (See figure 12, element SW1; [0074], lines 11-14).

With respect to Claim 22, a display device according to claim 21, Yanagi does not teach the transistor is a thin film transistor.

However, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to use thin film transistors as the switching element if the display device of Yanagi so as to have a faster response time and higher reliability, characteristic of a thin film transistor.



With respect to Claim 25, a display device of Yanagi as modified by Nanno et al. according to claim 2 teaches the charge pump control circuit comprises: a variable frequency-dividing circuit formed over the substrate; and a processing circuit formed over the substrate, which controls the variable frequency-dividing circuit.

8. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over are Yanagi et al. (Pub. No.: US 2002/0036636 A 1) in view of Nanno et al. (US patent # 6,909,413 B2) as applied to claims 2-5,10,14,18,21,22 and 25 above, and further in view of Ayres (Pub. No." US 2001/0007432 A1).

With respect to Claim 23, a display device according to claim 2, Yanagi does not teach the switching element is a diode. Ayres teaches the switching element is a diode (See figure 1, element 10; [0028]).

Ayres modifies the display device of Yanagi modified by Nanno et al. by replacing the switching elements with PIN diodes and forming the driving circuit, charge pump circuit, switching element, a charge pump circuit, and a charge pump control circuit on a common substrate ([0007]; [0015]).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have the driving circuit, the switching elements, charge pump circuit, and the charge pump control circuit formed over a common substrate, as taught by Ayres, to the display device of Yanagi modified by Nanno et al. so as to enable the charge pump circuit to be

Art Unit: 2629

formed using the same thin-film processing as may be required for other elements of the circuit, and enabling higher voltage TFT circuitry ([0007])

With respect to Claim 24, a display device according to claim 23, Yanagi does not teach the switching element is a PIN diode. Ayres teaches the switching element is a PIN diode (See figure 1, element 10; [0028]).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a switching element that is a PIN diode, as taught by Ayres, to the display device of Yanagi modified by Nanno et al., so as to reduce the resistance of the switching element without the increase in shunt capacitance ([0028]) and to enable the charge pump circuit to operate from a lower supply voltage than is possible with the use of TFTs ([0007], lines 1-3).

### ***Response to Arguments***

9. Applicant's arguments, see remarks, filed 02-12-2007, with respect to objection of claim 2 have been fully considered and are persuasive. The objection of claim 2 has been withdrawn.

10. Applicant's arguments, see remark, filed 02-12-2007, with respect to the rejection(s) of claim(s) 2 under Yanagi (Pub. No. US 2001/0007432 A1) in view of Ayres (Pub. No. US 2001/0007432 A1) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nanno et al. (US patent # 6,909,413 B2).

*Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kuwajima et al. (6,339,422 B1) Display control circuit and display control method..

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prabodh M. Dharia whose telephone number is 571-272-7668.

The examiner can normally be reached on M-F 8AM to 5PM.

13. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any response to this action should be mailed to:

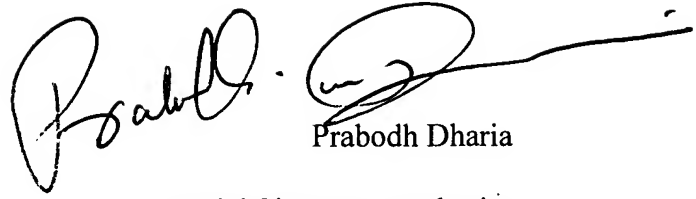
Commissioner of Patents and Trademarks

Washington, D.C. 20231

Application/Control Number: 10/687,655

Page 11

Art Unit: 2629

A handwritten signature in black ink, appearing to read 'Prabodh Dharia', with a long horizontal flourish extending to the right.

Prabodh Dharia

Partial Signatory Authority

AU 2629

February 28, 2007